

AB-15 - Paper

Prediction of fitness for service in UN military units

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A recently constructed personality instrument, the Commander Trait Inventory (CTI), intended for use in officer selection, was administered to a Swedish UN battalion prior to its deployment in Bosnia in the spring of 1998. CTI has 11 scales and is evaluated over five independent factor scores according to a nested measurement model having one general factor and four residual factors estimated by confirmatory factor analysis. The general factor Leader potential is to a certain extent influenced by the wish to present oneself as the "ideal employee". The four residual factors measure different kinds of unfitness for military service: Inflexibility, Adventureousness, Opportunism, and Unreliability. The factors were correlated with service grades for private soldiers, noncommissioned officers and officers. For the officers we found a logical pattern of correlations that indicate that CTI can be used as a selection tool for UN service.

The selection of officers to the Swedish defense forces was changed in the middle of the 1990-ies. A new computer-aided test battery was constructed for use in the selection process, as was a new personality inventory. This inventory, called Commander Trait Inventory (CTI), is at present subject to a series of validation studies. One of these studies is reported here. Sweden has a long tradition of participating in UN peace-keeping operations. In the conflict in former Yugoslavia, Sweden has participated with a battalion in Bosnia since 1993. At present, changes in the selection of personnel for battalions in international operations are being prepared. The aim of the present study is to examine the correlations between CTI measures and measures of performance after completed international service.

METHOD

The scales and factors of the instrument

A full description of CTI is to be found in its manual (Carlstedt & Widén, 1998). The reliability, expressed as Alpha coefficients, and the most characteristic statement for each of its eleven scales are presented in Table 1. The sample used was 1176 applicants for officer training in 1997.

TABLE 1.

Description of the scales: Number of statements, reliability (Alpha), and a representative statement

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Scales	Number of statements	Alpha	Representative statement
Sensation Orientation	15	.88	I seldom miss an opportunity that provides a challenge
Intuitive Decision-making	12	.86	I often see possibilities where others see difficulties
Concrete Thinking	12	.81	Concrete facts are the only things that matter
Abstract Thinking	16	.82	I spend quite a lot of time thinking and reflecting over different things
Superficial Value Orientation	14	.77	I keep up with all new trends
Ideological Value Orientation	11	.85	It is important to formulate your own ideals and to live by them
Empathy	15	.90	I often comfort colleagues who have problems
Leader Motivation	15	.89	I am suited for leading positions
Egocentrism	14	.86	My main purpose in life is to get as many goodies as I can
Impulsivity	14	.84	I quickly lose interest in tasks that I initiate
Ethnocentrism	9	.83	There will be problems if immigrants to a greater extent come to command Swedes

All scales have a good homogeneity. Six of the eleven scales forming the Commander Trait Inventory are intended to assess cognitive style, having Jung's theory of psychological types as a source of inspiration, but it was decided not to name them according to his theory. Instead, they have been named according to a comprehensive description of the content of the final scale.

The remaining five scales assess personality aspects presumed essential to the officer profession. *Empathy* and *Leadership Motivation* should be regarded as necessary but not sufficient qualities in leadership, while *Egocentrism*, *Impulsivity* and *Ethnocentrism* should be sufficient signs of unsuitability for the officer profession, mainly for ethical and moral reasons.

Confirmatory factor analysis

Confirmatory factor analysis (Jöreskog & Sörbom, 1993) was used in order to define and test an hierarchical measurement model, consisting of one "ideal employee factor" and four residual factors.

The model, with one general factor and residual factors is orthogonal, i.e. the correlations between the factors are close to zero, see table 3 below. Personality instruments yielding uncorrelated factors in selection situations are rare to find.

The following analysis was performed on data from applicants for the officer profession collected in 1997. The confirmatory factor analysis, accounted for in Table 3 below, shows an acceptable fit to data (GFI = .96, AGFI = .91, RMSEA = .09, $\chi^2 = 313.7$, df = 31, $p = .00$).

TABLE 2. Factor loadings from a Confirmatory factor analysis of the CTI scales (n=1176).

	Leader potential	Inflexibility	Adventure ousness	Opportunism	Unreability
Sensation orientation	.50		.49		.23
Intuition	.83				
Concrete thinking	.48	.43	-.30	.16	
Abstract thinking	.35	.64			
Superficial value orientation	.31			.89	
Ideological valure orientation	.58	.36			
Empathy	.59			.19	-.27
Leader motivation	.83				
Impulsivity	-.22		.51		.52
Egocentrism	(.07)			.25	.89
Ethnocentrism	(-.09)			.20	.52

All displayed factor loadings and factors are significant, with the exception of those in parentheses.

It is possible to find models with slightly better goodness-of-fit than the one presented above. The present solution, however, was chosen because of its simplicity and because it was judged to have a higher psychological credibility than the alternative solutions available. Validation studies against job-related criteria will show if the choice made can be justified.

Interpretation of the factors

Factor 1: Leader Potential

High factor scores: For leadership optimal combination of different personality traits. High leadership motivation and high confidence in one's fast intuitive decision-making. Empathic ability and ideological value orientation. A high score *may* indicate a socially agreeable response set and an obviously beautyfying self-picture.

Low factor scores: Cautious, bad self-confidence, not competitive, low interest for leading positions.

Factor 2: Inflexibility

High factor scores: Structures life through rational and systematic thinking processes. Sorts experiences and facts in concrete categories or in terms of models, theories and value systems. This leads to an inflexible and "square" way of handling life.

Low factor scores: Attaches little importance to concrete facts or to systematizing and evaluating experiences.

Factor 3: Adventureousness

High factor scores: Impulsive and little reflective. Strives constantly towards new sensory impressions and new experiences.

Low factor scores: Cautious and orderly.

Factor 4: Opportunism

High factor scores: Egoistic superficial docility and adaptability in limited social environments.

Low factor scores: Stubborn, uncompromising attitude towards the social environment.

Factor 5: Unreliability

High factor scores: Egocentric, ethnocentric and impulsive. Lack of empathy.

Low factor scores: Empathic and altruistic.

Correlations between the factors

The correlations between factor scores on the five factors are shown in Table 4 below.

TABLE 3. Correlations between standardized factor scores on the five factors (n=1196).

	Leader potential	Inflexibility	Adventureousness	Opportunism	Unreliability
Leader potential	1.00				
Inflexibility	.00	1.00			
Adventureousness	-.05	.06	1.00		
Opportunism	.08	.03	.03	1.00	
Unreliability	-.09	.08	.23	.06	1.00

The correlations between the factors are lower than those between the scales. The factor solution can be said to be orthogonal. The correlations are so low that an individual's

profile can be interpreted directly to reveal his "true" values in the different factors.

The reliability of the factors cannot be calculated with traditional methods. However, Huang (1997) has presented a method that admits calculation of factor reliability, resulting in a measure called determinacy, which is shown in Table 5.

TABLE 4. Factor determinacy.

Factor	Determinacy
Leader Potential	0.95
Inflexibility	0.83
Adventureousness	0.72
Opportunism	0.70
Unreliability	0.89

According to the convention, *Opportunism* and *Adventureousness* have a somewhat low reliability, whereas the three remaining factors have a satisfactory reliability.

Sample

CTI was administered, prior to deployment, at a convention where all personnel in the battalion was present, with the exception of certain personnel undergoing special training. In the officer group, those missing were mainly officers in the battalion staff. In the soldier group, certain special units were unable to participate. However, the remaining sample can be looked upon as being representative of a Swedish UN battalion.

The list of battalion personnel has 387 names that made service throughout the 6 month period. There is both military and civilian personnel in a battalion, the military being composed of commissioned officers, reserve officers, conscript NCOs, and conscript private soldiers. The civilians are chiefly specialists with UN officer grades. The study is concerned with military personnel only. The table below describes the sample involved in the study.

Officers		NCOs		Privates	
Total	Sample	Total	Sample	Total	Sample
75	38	68	44	217	138

Criteria

After completion of service conscript NCOs and privates receive grades on 10-grade scales concerning Overall competence and Job knowledge from their commander.

Commissioned and reserve officers receive grades on 5-grade scales in the following 8 variables: Skill, Working capacity, Mental flexibility, Judgment, Mental stability, Cooperation, Physical condition, and Leadership, plus a Summary grade, also on a

5-grade scale. They also receive a Promotion recommendation on a 10-grade scale.

RESULTS

In the following tables statistically significant correlations ($p < .05$) between CTI factors and criteria are written in bold type.

TABLE 5.

Correlations in the soldier group($n = 138$) between CTI factors and the criteria Overall competence and Job competence

	Overall competence	Job knowledge
Leader potential	.15	.13
Inflexibility	-.18	-.09
Adventureousness	-.09	-.12
Opportunism	-.02	-.14
Unreliability	-.01	-.13

Only one correlation is significant, the negative one between *Inflexibility* and Overall competence. It should be noted, however, that *Leader potential* correlates positively with both criteria, whereas the four unsuitability factors have negative correlations.

TABLE 6.

Correlations in the NCO group ($n = 54$) between CTI factors and the criteria Overall competence and Job competence

	Overall competence	Job knowledge
Leader potential	.05	-.01
Inflexibility	-.17	-.12
Adventureousness	.09	-.12
Opportunism	.11	-.28
Unreliability	.00	-.24

In the NCO group we find three significant negative correlations. *Inflexibility* has a negative correlation with Overall competence, and *Opportunism* and *Unreliability* negative correlations with Job knowledge.

TABLE 7.

Correlations between CTI factors and criterion variables in the officer group ($n = 38$)

	Skill	Working capacity	Mental flexibility	Judgment	Mental stability	Cooperat-ion	Physical condition	Leader-ship	Summary grade	Promotion recommend
Leader potential	-.04	.15	.02	-.03	.07	.22	.03	.30	.05	.41
Inflexibility	.12	.07	-.11	-.18	-.11	-.30	.20	-.33	.02	-.45
Adventureousness	.03	-.03	.03	-.02	.17	.17	.10	.00	.09	-.07
Opportun-ism	-.24	-.18	-.29	.06	.08	.07	-.27	.02	-.28	.09
Unreliabil-ity	.06	-.27	-.39	-.31	-.10	-.31	-.07	.04	-.28	-.12

Leader potential has significant positive correlations with Leadership and Promotion recommendation. *Inflexibility* correlates with poor cooperation ability, with poor leadership and with dubious possibilities of being promoted. *Unreliability* has negative correlations with Mental flexibility, Judgment, and Cooperation. Adventureousness and Opportunism has no significant correlations with criteria. The criterion variables Skill, Working capacity, Mental stability, Physical condition, and Summary grade do not correlate with any CTI factor.

DISCUSSION

CTI was constructed for use in officer selection and is evaluated over five factors, one positive

called *Leader potential* and four negative factors called *Inflexibility*, *Adventureousness*, *Opportunism*, and *Unreliability*.

The sample in this study was divided into three groups. In the soldier group only one significant correlation was found, a negative one between *Inflexibility* and Overall competence.

In the NCO group three significant correlations were found. As in the soldier group there is a correlation between *Inflexibility* and low Overall competence. Also, low Job knowledge correlates with *Unreliability* and *Opportunism*. These latter correlations are low, but seem logical. For selection of soldiers and NCOs for international service other information sources than CTI seem to be better predictors, however, e.g. enlistment results and grades from compulsory military refresher courses (Carlstedt & Johansson, 1995).

In the officer group we find that *Leader potential* covaries with good Leadership and recommendation for Promotion, and *Inflexibility* with poor Cooperation ability, poor Leadership, and less good Promotion possibilities. *Unreliability* correlates with low Mental flexibility, lack of Judgment, and poor Cooperation ability.

The significant correlations that have been shown to exist between CTI factors and the criterion variables are all related to the concepts of management and leadership, while criterion variables as Skill, Working capacity, and Physical condition, that show no correlations with CTI factors, are more related to a specialist role. The three CTI factors

having the highest reliability also show significant correlations with two or three criterion variables. *Adventureousness*, having low reliability, has no significant correlation with any criterion variable. The Summary grade shows close to negative correlations with *Opportunism* and *Unreliability*.

Even though the officer group in this study is small, there is a logical structure in the correlations with criteria that suggests that CTI should be introduced into the discussion of a new selection instrument for officers applying for international service. Also, it should be possible to use CTI as an instrument for prediction of leadership in a broader sense.

REFERENCES

Carlstedt, B. & Johansson, E (1995). Selection of UN personnel (in Swedish). FOA R 95-00089-5.3 SE. Jan 1995. ISSN 1104-9154.

Carlstedt, L.& Widén, H. (1998). Commander Trait Inventory (in press). National Defence College. Sweden.

Huang, L.C. (1997). Predictive validity in personnel selection using latent variable models. Unpublished doctoral dissertation. University of California. Los Angeles.

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